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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Inventors: Notaro et al

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Title: LOW VOID ADSORPTION
SYSTEMS AND USES THEREOF

Examiner: SPITZER

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Assistant Commissioner for Patents

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AMENDMENT AFTER FINAL REJECTION

This is in response to the Final Rejection mailed June 21, 2002. A two-months extension of time is attached hereto in duplicate.

Please amend the application as follows:

In the specification:

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Page 6, second full paragraph:

In one embodiment of the present invention, a low pressure swing adsorption system is taught wherein flow movement and pressure pulse are influenced from the same pressure source. The pressure source may be a high pressure source or a low pressure sink. The system includes at least one vessel containing an adsorbent bed. An inlet (feed end) is coupled to the vessel by way of an inlet header and an outlet (production end) is coupled to the vessel by way of an outlet header. The inlet header and the outlet header of each vessel have a combined volume of less than approximately 20% of the volume of the adsorbent bed. Preferably, this volume is limited to less than 10% and most preferably to less than 5%. Each inlet is coupled to a high pressure source or a low pressure sink. This configuration is depicted in Figures 2a and 2b, discussed in detail below. It is notable that void volumes of less than about 20% of the adsorbent bed can be achieved in nearly all bed configurations except radial bed configurations. One skilled in the art would acknowledge that void volumes this low are not readily realized in radial bed configurations. For radial beds, the present invention can achieve void volumes of less than 50%.

On page 12, first full paragraph:

Second, more than one high pressure source and/or low pressure sink may be mounted proximate to, or nearly proximate to, each vessel, by suitably employing multiple inlets and/or outlets. These inlets and outlets improve flow distribution within the adsorbent bed headers and reduce header void space. For example, the ratio of the volume of the void space to the volume of the adsorbent bed is minimized. The resultant system has a reduced total void space as compared with the PSA systems taught in the prior art.